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10/669,790

09/25/2003

Yoshiyuki Sogawa

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EXAMINER

SCHAFFER, JONATHAN C

ART UNIT

PAPER NUMBER

2624

MAIL DATE

DELIVERY MODE

10/29/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/669,790

Applicant(s)

SOGAWA, YOSHIYUKI

Examiner

Jonathan C. Schaffer

Art Unit

2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 July 2007.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Applicant's response to the last Office Action, filed 07/17/2007, has been entered and made of record.
2. Applicant has amended claims 1-2, 4-5, 7-8 & 10-14. Claims 15-18 have been added. Claims 1-18 are currently pending.

Requirement For Information

3. Applicant and the assignee of this application are required under 37 CFR 1.105 to provide the following information that the examiner has determined is reasonably necessary to the examination of this application. The information is required to document the level of skill and knowledge in the art of stereoscopic image processing.
4. In response to this requirement, please provide answers to each of the following interrogatories eliciting factual information:

The amendment filed July 7th, 2007 states that the "Examiner alleges that the Matsumoto et al. reference teaches ... **region size changing means for changing a size of first and second pixel blocks that are used in evaluating a correlation of brightness...**" The Applicant further states that "the Matsumoto et al. reference does not teach or suggest the features..." Is the Applicant alleging that **region size changing means for changing a size of first and second pixel blocks that are used in evaluating a correlation of brightness** are in fact unknown in the prior art? Is the Inventor or the Assignee of record aware of work by another performed before September 27th, 2002 that includes **region size changing means for changing a size of first and second pixel blocks that are used in evaluating a correlation of brightness**? If such a work by another is known to the Inventor or the Assignee then disclose this information in an information disclosure statement. If such information has previously been disclosed by the applicant or in a reference listed in the PTO-892, then identify the reference, page and line number that shows this information. If such information is not in the English language then provide a translated copy of the information. Has the applicant or the assignee of record

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filed any applications in this or a foreign country that disclose or claim **region size changing means for changing a size of first and second pixel blocks that are used in evaluating a correlation of brightness**? If so, please disclose these applications. Has this Office or a foreign Office ever rejected any claims filed by the assignee that include **region size changing means for changing a size of first and second pixel blocks that are used in evaluating a correlation of brightness**? If so, please disclose the rejections.

The amendment states that the "Examiner alleges that the Matsumoto et al. reference teaches ... **weighting factor changing means for changing the weighting factor that is used by a correlation evaluating means that evaluates a correlation of brightness...**" The Applicant further states that "the Matsumoto et al. reference does not teach or suggest the features..." Is the Applicant alleging that a **weighting factor changing means for changing the weighting factor that is used by a correlation evaluating means that evaluates a correlation of brightness** is in fact unknown in the prior art? Is the Inventor or the Assignee of record aware of work by another performed before September 27th, 2002 that includes a **weighting factor changing means for changing the weighting factor that is used by a correlation evaluating means that evaluates a correlation of brightness**? If such a work by another is known to the Inventor or the Assignee then disclose this information in an information disclosure statement. If such information has previously been disclosed by the applicant or in a reference listed in the PTO-892, then identify the reference, page and line number that shows this information. If such information is not in the English language then provide a translated copy of the information. Has the applicant of the assignee of record filed any applications in this or a foreign country that disclose or claim a **weighting factor changing means for changing the weighting factor that is used by a correlation evaluating means that evaluates a correlation of brightness**? If so, please disclose these applications. Has this Office or a foreign Office ever rejected any claims filed by the assignee that include a **weighting factor changing means for changing the weighting factor that is used by a correlation evaluating means that evaluates a correlation of brightness**? If so, please disclose the rejections.

The amendment states that the "Examiner alleges that the Matsumoto et al. reference teaches ... **changing a size of first and second pixel blocks that are used for evaluating a correlation of**

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brightness..." The Applicant further states that "the Matsumoto et al. reference does not teach or suggest the features..." Is the Applicant alleging that **changing a size of first and second pixel blocks that are used for evaluating a correlation of brightness** is in fact unknown in the prior art? Is the Inventor or the Assignee of record aware of work by another performed before September 27th, 2002 that includes **changing a size of first and second pixel blocks that are used for evaluating a correlation of brightness**? If such a work by another is known to the Inventor or the Assignee then disclose this information in an information disclosure statement. If such information has previously been disclosed by the applicant or in a reference listed in the PTO-892, then identify the reference, page and line number that shows this information. If such information is not in the English language then provide a translated copy of the information. Has the applicant or the assignee of record filed any applications in this or a foreign country that disclose or claim **changing a size of first and second pixel blocks that are used for evaluating a correlation of brightness**? If so, please disclose these applications. Has this Office or a foreign Office ever rejected any claims filed by the assignee that include **changing a size of first and second pixel blocks that are used for evaluating a correlation of brightness**? If so, please disclose the rejections.

The amendment states that the "Examiner alleges that the Matsumoto et al. reference teaches ... **changing a weighting factor for evaluating a correlation of brightness**..." The Applicant further states that "the Matsumoto et al. reference does not teach or suggest the features..." Is the Applicant alleging that **changing a weighting factor for evaluating a correlation of brightness** is in fact unknown in the prior art? Is the Inventor or the Assignee of record aware of work by another performed before September 27th, 2002 that includes **changing a weighting factor for evaluating a correlation of brightness**? If such a work by another is known to the Inventor or the Assignee then disclose this information in an information disclosure statement. If such information has previously been disclosed by the applicant or in a reference listed in the PTO-892, then identify the reference, page and line number that shows this information. If such information is not in the English language then provide a translated copy of the information. Has the applicant or the assignee of record filed any applications in this or a foreign country that disclose or claim **changing a weighting factor for evaluating a correlation of**

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brightness? If so, please disclose these applications. Has this Office or a foreign Office ever rejected any claims filed by the assignee that include **changing a weighting factor for evaluating a correlation of brightness?** If so, please disclose the rejections.

In response to this requirement, please state whether any search of prior art was performed. If a search was performed, please state the citation for each prior art collection search. If any art retrieved from the search was considered material to demonstrating the knowledge of a person having ordinary skill in the art to which the Applicant's claimed invention pertains, please provide the citation for each piece of art considered and a copy of the art in the English language.

For example, if a search was performed by the Japanese Patent Office for the corresponding Japanese application, please submit a copy of the Japanese search results. If a rejection was made in the corresponding Japanese application, please submit a copy of the Japanese rejection. If this application has a corresponding application filed in any other country, please submit the search and examination reports from those countries. For example, if this invention was filed in Europe, please submit a copy of the European search report and any Office actions made by a Patent Office in a European country.

This requirement is an attachment of the enclosed Office Action. A complete reply to the enclosed Office Action must include a complete reply to this requirement. The period for reply to this requirement coincides with the time period for reply to the enclosed Office Action.

Response to Arguments

Applicant's amendments to the claims have overcome the rejections based on 35 U.S.C. 112, second paragraph.

Applicant has failed to overcome the rejection under 35 U.S.C. 102(e). Applicant has failed to overcome the rejection under 35 U.S.C. 103. Applicant's arguments filed July 17th, 2007 have been fully considered but they are not persuasive.

The Applicant argues that, "Indeed, the Matsumoto et al. reference does not even teach or suggest any parallax calculating system or method at all..." The Examiner would like to remind the Applicant that the Examiner cites particular columns and line numbers in the reference that was applied to

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the claims for the convenience of the Applicant. Although the specified citations are representative of the teachings in the art as applied to the specific limitations within individual claims, other portions of these references, as well as other passages and figures in the art of record, may apply as well. For example, the abstract states "a parallax is calculated", this is but one of many such citations referencing the calculation of a parallax. It is respectfully requested that, in preparing responses, the Applicant fully consider the art of record in its entirety as potentially teaching all or part of the claimed invention, such as the abstract, which clearly discloses a parallax calculation.

The Applicant argues that Matsumoto et al. does not disclose a region size changing means for changing the size of first and second pixel blocks that are used in evaluating a correlation of brightness. In a similar argument the Applicant states that Matsumoto et al. fails to disclose changing a size of first and second pixel blocks that are used for evaluating a correlation of brightness. In addition to the portions already cited by the examiner in the previous Office Action Matsumoto et al. discloses the changing in size of pixel blocks, which are used in evaluating a correlation of brightness in (§§ 0099-0115 & ¶ 0139).

The Applicant argues that Matsumoto et al. does not disclose a weighting factor changing means for changing the weighting factor that is used by a correlation evaluating means that evaluates a correlation of brightness. In a similar argument the Applicant states that Matsumoto et al. fails to disclose changing a weighting factor for evaluating a correlation of brightness. In addition to the portions already cited by the examiner in the previous Office Action Matsumoto et al. discloses the changing in size of pixel blocks, which are used in evaluating a correlation of brightness in (§§ 0099-0115 & ¶ 0138-0139).

The Applicant Further alleges that "Embodiment 5 ... is completely different from Embodiment 1..." In response to this allegation the Examiner would like to direct the Applicant's attention to (§ 0304) which clearly states that, "Embodiment 5 ... is substantially the same as Embodiment 1..." It is respectfully requested that, in preparing responses, the Applicant fully consider the art of record in its entirety as potentially teaching all or part of the claimed invention, such as the aforementioned paragraph.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-6 and 8-14 are rejected under 35 U.S.C. 102(e) as being anticipated by Matsumoto et al. (U.S. Publication Number 2001/0045979).

1. A stereoscopic image processing apparatus for calculating a parallax between a pair of images, comprising:

correlation evaluating means for evaluating a correlation of brightness between a first pixel block provided in one of said pair of images and a second pixel block provided in the other of said pair of images; and

Matsumoto teaches determining corresponding points which are representative of pixel blocks of varying sizes (ex. 3x3 or 8x8 or 16x16) by evaluating a correlation of grey-scale levels which is the same as brightness between a first pixel block $Pt(i,j)$ of one of two frames under analysis and a second pixel block $Pt'(i,j)$ of the second of two frames under analysis (§ 0112-0116).

region size changing over means for changing over a size of said first and second pixel blocks in evaluating said correlation.

Matsumoto teaches altering the size of pixel blocks (§ 0099-0115 & § 0139 & § 0307-0308 & § 0323).

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2. The stereoscopic image processing apparatus according to claim 1, wherein said size of said first and second pixel blocks is changed over in accordance with an area where said first pixel block is located.

Matsumoto discloses changing a pixel blocks size due to location in order to create a more natural image once the depth of the image components is known (§ 0099-0115 & § 0139 & § 0307-0308 & § 0323).

3. The stereoscopic image processing apparatus according to claim 2, wherein said area is divided into two areas, an upper area and a lower area, by a horizontal boundary line.

Matsumoto discloses dividing the area into multiple areas including upper and lower using a horizontal boundary line (Fig. 16).

4. The stereoscopic image processing apparatus according to claim 3, wherein said size of said first and second pixel blocks is changed over to said first size when said first pixel block is located in said lower area.

As can be seen in Fig. 16 & 29 & 30 the size of pixel blocks have been changed when the pixel block is located in the lower area.

5. The stereoscopic image processing apparatus according to claim 2, wherein said area is divided into a plurality of areas and said size of said first and second pixel blocks is changed over to respective specified size of said first pixel block in accordance with said respective areas where said first pixel block is located.

(§ 0099-0115 & § 0139 & § 0307-0308 & § 0323)

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6. The stereoscopic image processing apparatus according to claim 1, wherein said first and second pixel blocks have a first size and a second size which is larger than said first size.

(¶ 0099-0115 & ¶ 0139 & ¶ 0307-0308 & ¶ 0323)

8. A stereoscopic image processing apparatus for calculating a parallax between a pair of images, comprising:

correlation evaluating means for evaluating a correlation of brightness between a first pixel block provided in one of said pair of images and a second pixel block provided in the other of said pair of images;

Matsumoto teaches determining corresponding points which are representative of pixel blocks of varying sizes (ex. 3x3 or 8x8 or 16x16) by evaluating a correlation of grey-scale levels which is the same as brightness between a first pixel block $P_t(i,j)$ of one of two frames under analysis and a second pixel block $P_t'(i,j)$ of the second of two frames under analysis (¶ 0112-0116).

weighting factor means for applying weighting a factor to each of pixel constituting said first and second pixel blocks in evaluating said correlation; and

Matsumoto discloses applying a weighting factor to both pixel blocks (¶ 0099-0115 & ¶ 0135- 0155).

weighting factor changing over means for changing over said weighting factor in evaluating said correlation.

Matsumoto also discloses altering or changing over the weighting factor in the correlation evaluation (¶ 0099-0115 & ¶ 0135- 0155).

9. The stereoscopic image processing apparatus according to claim 8, wherein said weight factor is established to 0 at a surrounding region around a central region of said first and second pixel blocks.

(¶ 0099-0115 & ¶ 0135- 0155)

10. A stereoscopic image processing method of calculating a parallax between a pair of images, comprising the steps of:

evaluating a correlation of brightness between a first pixel block provided in one of said pair of images and a second pixel block provided in the other of said pair of images; and

Matsumoto teaches determining corresponding points which are representative of pixel blocks of varying sizes (ex. 3x3 or 8x8 or 16x16) by evaluating a correlation of grey-scale levels which is the same as brightness between a first pixel block $P_t(i,j)$ of one of two frames under analysis and a second pixel block $P_t'(i,j)$ of the second of two frames under analysis (¶ 0112-0116).

changing over a size of said first and second pixel blocks.

Matsumoto teaches altering the size of pixel blocks (¶ 0099-0115 & ¶ 0139 & ¶ 0307-0308 & ¶ 0323).

11. The method according to claim 10, wherein the step of changing over said first and second pixel blocks includes changing over in accordance with an area where said first pixel block is located.

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Matsumoto discloses changing a pixel blocks size due to location in order to create a more natural image once the depth of the image components is known (§ 0099-0115 & § 0139 & § 0307-0308 & § 0323).

12. The method according to claim 11, further comprising the step of dividing said area into two areas, an upper area and a lower area, by a horizontal boundary line.

Matsumoto discloses dividing the area into multiple areas including upper and lower using a horizontal boundary line (Fig. 16).

13. The method according to claim 11, further comprising the step of dividing said area into a plurality of areas by a plurality of boundary lines.

Matsumoto discloses dividing the area into multiple areas boundary lines (Fig. 16).

14. A stereoscopic image processing method of calculating a parallax between a pair of images, comprising the steps of:

evaluating a correlation of brightness between a first pixel block provided in one of said pair of images and a second pixel block provided in the other of said pair of images;

Matsumoto teaches determining corresponding points which are representative of pixel blocks of varying sizes (ex. 3x3 or 8x8 or 16x16) by evaluating a correlation of grey-scale levels which is the same as brightness between a first pixel block $P_t(i,j)$ of one of two frames under analysis and a second pixel block $P_t'(i,j)$ of the second of two frames under analysis (§ 0112-0116).

applying weighting a factor to each of pixel constituting said first and second pixel blocks in evaluating said correlation; and

Matsumoto discloses applying a weighting factor to both pixel blocks (§ 0099-0115 & § 0135- 0155).

changing over said weighting factor in evaluating said correlation.

Matsumoto also discloses altering or changing over the weighting factor in the correlation evaluation (§ 0099-0115 & § 0135- 0155).

15. The apparatus of claim 1, further comprising a parallax calculating means for calculating the parallax between the pair of images based upon the correlation of brightness.

(§ 0039 & § 0092 & § 0197-0198 & § 0222-0224)

16. The apparatus of claim 1, wherein the region size changing means changes a size of the first and second pixel blocks based upon the location of one of the first and second pixel blocks within a corresponding one of the pair of images.

(§ 0099-0115 & § 0139 & § 0307-0308 & § 0323)

17. The apparatus of claim 16, wherein the region size changing means changes a size of the first and second pixel blocks based upon the location of one of the first and second pixel blocks within a corresponding one of the pair of images with respect to a horizontal line in said corresponding one of the pair of images.

(§ 0099-0115 & § 0139 & § 0307-0308 & § 0323 & Fig. 16, 29)

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18. The apparatus of claim 17, wherein the region size changing means changes a size of the first and second pixel blocks such that said size of said first and second pixel blocks is larger above the horizontal line and smaller below the horizontal line.

(¶ 0099-0115 & ¶ 0139 & ¶ 0307-0308 & ¶ 0323 & Fig. 16, 29, 30)

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto et al. (U.S. Publication Number 2001/0045979).

7. The stereoscopic image processing apparatus according to claim 1, wherein said size of said first and second pixel blocks is changed over in accordance with imaging conditions including at least rain, fog, snow, backlight, nighttime, snow on road, stain or droplet on front windshield.

Matsumoto discloses processing the pixel blocks using gray-scale levels which is the same as brightness which can change due to weather (¶0031) and then changing the size of these blocks using this information (¶ 0307-0308 & ¶ 0323). Matsumoto does not however disclose that weather is at least rain, fog or snow. The Examiner takes Official Notice that rain, fog and snow are obvious forms of weather, and it would have been obvious to one of ordinary skill in the art to which the Applicant's claimed invention pertains to include them in the processing because they cause a change in the brightness and therefore effect the processing in a negative way if not considered in the processing algorithm.

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Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

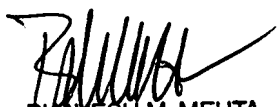
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan C. Schaffer whose telephone number is (571)272-0603. The examiner can normally be reached on 7:30am - 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (571)272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JS


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